GaAs next nearest neighbour

When physicists form atomic surfaces using the technologically important semiconductor material gallium arsenide (GaAs), the surfaces appear in one of two kinds of state: flat or rough. But a team of physicists from Universisty of Arkansas, Albany and Oklahoma show experimentally that there's a third type of surface, and this state depends upon the interactions of distant atomic neighbours.

Using SEM to examine the GaAs surface at different temperatures and pressures, they found the surface goes through an in-between stage, where the disorder does not appear at the macroscopic level but can be seen as a series of up-down steps, or two-dimensional islands. The researchers call this state a "disordered flat" surface.

An elevated temperature causes enough of an energy boost to loose some atoms from their moorings and create slight disorder, but atoms further away continue to keep the 'loose' atoms from piling up on one another to form islands. The researchers also found that changing the pressure of arsenic within the system could drive the smooth to rough transitions. Knowing that gallium arsenide exhibits this intermediate surface may help researchers build and better control the growth of quantum dots and quantum wires for use in technological applications.

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Sensor suite for Condor II

BAE Systems is working with the UK MOD to develop CONDOR II capability to enhance situational awareness on helicopters. This demonstrates state of the art sensor and system integration technology. BAE Systems will supply an integrated sensor suite including EO, Low Light TV, TERPROM and a Laser Radar. Data will be fused together to produce a composite picture, which is displayed in a helmet mounted display system. CONDOR II will build on the work carried out by the UK MOD in the CONDOR I programme which analysed various integrated sensor technologies. It is expected that it will be ready to be fitted on new and existing helicopters in the next two to three years. The initial programme will include two flight demonstrations and a ground simulation demonstration. Engineering will take place at BAE Systems Basildon, Rochester and Plymouth sites.

GaAs FET satellite communications

What is claimed to be the industry's first 90W c-band GaAs field effect transistor (GaAs FET) suitable for use in solid-state power amplifiers (SSPA) for base station or earth-station satcom and radar applications, as well as for microwave digital radios for terrestrial communications, has been released by Toshiba America Electronic Components Inc. Using TAEC's HFET process technology, the TIM5964-90SL GaAs FET employs ion plantation technology to produce an output power of 49.5dBm at a frequency range of 5.9GHz to 6.4GHz. and is priced at around $1,500 each.

"The development of this 90W solution will enable customers to design higher performance SSPAs, and can simplify existing designs by reducing the part count by replacing multiple lower power GaAs FETs with this 90W device," says business development manager, Toshi Nakamura.

Infineon's SiGe record

Infineon has taken what it claims is the world record for the highest clocked integrated circuit with a chip that operates at 110GHz - more than 34 times faster than the top-clocked Intel Pentium 4.

The record was broken in the company's labs in Munich. Infineon got the chip running between ten and 30 % faster than rival offerings, it claims.

The IC in question is a dynamic frequency divider, and was produced using Infineon's own Silicon Germanium bipolar process.

Infineon claims the technology can be used to build chips that will be able to operate at up to 200GHz.

None of these however are designed for computer applications.

Infineon's SiGe chips are being developed for high-speed communications systems such as mobile phone base stations and microwave radio links, and high frequency applications like car anti-collision systems as well as ultra wideband (UWB) communications devices.

Technology: Microelectronics

Soft & etch strategy

FEI Company has made two strategic acquisitions to augment its circuit edit business, adding laser micro machining to its technology portfolio and support of its design-to-yield strategy. It is purchasing EGSoft's Design for Manufacturing CAD navigation and semiconductor fab yield management software product lines, formerly Knights Technology, and to be marketed as FEI Knights. It will pay $6m cash and expects the purchase to be accretive for fiscal 2003. FEI also acquired privately held Revise Inc, and its laser etch technologies for advanced circuit edit products.

Upmarket Endwave

RF subsystems Endwave Corp has predicted that its Q2 revenues would be much higher than anticipated. Based on preliminary results, total revenues for the Q2 June 30, 2003 will be in the range of $8.2-8.5m. "We are pleased with these very positive preliminary results," says Ed Keible, CEO and president of Endwave.

Infrared ahead

Sensors Unlimited, maker of imaging products based on InGaAs, has won a $890,000 contract from the DARPA. Under the nine-month contract, the company will develop what is said to be the industry's first all solid-state night vision 640x512 camera, operating at room temperature, which will be sensitive from 0.9-1.7 microns. Sensors Unlimited recently won a military contract for High Resolution InGaAs Shortwave Infrared Night Vision Imaging Systems and in June won a DOD contract for an Advanced Detector Technology Programme.